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(54) **CLIMBING SHOE**

(57) A climbing shoe (1) comprising: a substantially sock-like shoe-upper (2) which is shaped so as to accommodate and completely cover the foot of the user; a rear protective insert (14) made of elastomeric material, which has a concave shape and is firmly fixed on the rear part of the shoe-upper (2) so as to cover the calcaneus of the user's foot; a rear sole (5) which is firmly fixed to the bottom (4) and to the rear part of the shoe-upper (2), above the rear protective insert (14); and a plurality of tensioning bands (7, 8) made of elastic material, which

are firmly fixed to the shoe-upper (2) so as to tighten the shoe-upper (2) onto the foot of the user; the rear sole (5) being substantially L-shaped so as to have an horizontal segment (15) covering the talus-calcaneal portion (4c) of the bottom (4) of the shoe-upper (2), and a vertical segment (16) rising along the heel portion (10) of the shoe-upper (2) while remaining astride the midplane of the shoe (M) and which is embedded in a vertical groove (15) specifically obtained in the rear protective insert (14). (Figure 1)

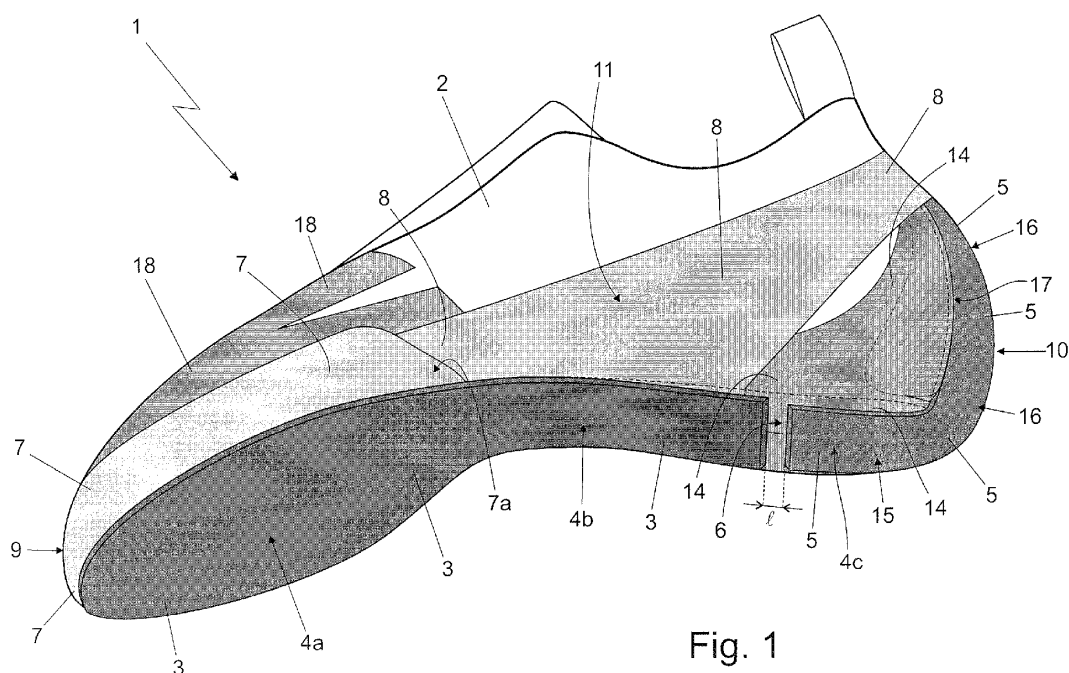


Fig. 1

Description

PRIORITY CLAIM

[0001] This application claims priority from International Application No. PCT/IT2017/000127 filed on June 16, 2017 and Italian Patent Application No. 102017000067372 filed on June 19, 2017.

[0002] The present invention relates to a climbing shoe.

[0003] As is known, climbing shoes generally comprise: a leather shoe-upper which is substantially sock-shaped so as to accommodate and completely cover the foot, including the sole of the foot; a front tensioning band made of highly elastic rubber, which is substantially U-bent and is fixed by gluing onto the tip of the shoe-upper so as to surround the tarsus-phalangeal region of the foot; a rear tensioning band made of highly elastic rubber, which is substantially U-bent and is fixed by gluing to the rear part of the shoe-upper so as to cover the region above the calcaneus of the foot, and then extends along the two lateral sides of the shoe-upper up to meet and join to the front tensioning band; and a sole made of soft, flexible and substantially non-extendible elastomeric material with high friction coefficient, which is fixed by gluing to the bottom of the shoe-upper, above the front and rear tensioning bands, so as to cover the whole sole of the user's foot.

[0004] In many models of climbing shoes, the sole is moreover provided at the back with a large oblong tongue that rises along the heel up to the height of the rear tensioning band while remaining substantially astride the midplane of the shoe, and in addition overlaps two protective inserts made of low-elasticity rubber or other similar elastomeric material, which are substantially seashell-shaped and are fixed by gluing onto the two lateral sides of the shoe-upper so as to cover and protect both sides of the calcaneus of the user's foot.

[0005] Unfortunately, experimental tests have found that the rear part of the climbing shoe is frequently subject to particularly high tangential stresses that, in some cases, are discharged directly onto the lateral side of the rear tongue of the sole, causing firstly the fraying of the tongue and then its complete detachment, with all the problems that this entails in terms of the structural integrity of the sole.

[0006] Aim of the present invention is therefore to provide a climbing shoe that overcomes the drawbacks described above.

[0007] In compliance with the above aims, according to the present invention there is provided a climbing shoe as defined in claim 1 and preferably, though not necessarily, in any one of the dependent claims.

[0008] The present invention will now be described with reference to the accompanying drawings, which illustrate a non-limiting embodiment thereof, in which:

- Figure 1 is a perspective and schematic view of a

climbing shoe realized according to the teachings of the present invention;

- Figure 2 is a front view of the rear part of the climbing shoe shown in Figure 1, with parts removed for the sake of clarity;
- Figure 3 is a view of the rear part of the climbing shoe shown in Figure 2, sectioned along section line X-X; whereas
- Figures 4, 5, 6 and 7 are respective perspective views of the climbing shoe shown in Figures 1 and 2 with parts removed for the sake of clarity.

[0009] With reference to Figures 1 to 7, reference numeral 1 denotes as a whole a climbing shoe that may be particularly advantageously used for climbing on rock walls classified as grade IV or lower, where climbers may have to use the heel of their foot for climbing.

[0010] The climbing shoe 1 firstly comprises: a shoe-upper 2, preferably made of leather, which is substantially sock-shaped so as to accommodate and completely cover the foot of the user, including the sole of the foot; and a front sole 3 made of a soft, flexible and substantially non-extendible elastomeric material with a high friction coefficient, which is firmly fixed to the bottom or insole 4 of shoe-upper 2 preferably by gluing.

[0011] More in detail, the bottom or insole 4 of shoe-upper 2 is divided longitudinally into a front or tarsus-phalangeal portion 4a that is immediately underneath the tarsus-phalangeal region of the sole of the user's foot; a central or plantar-arch portion 4b that is immediately underneath the plantar arch region; and a rear or talus-calcaneal portion 4c that is immediately underneath the talus-calcaneal region of the sole of the user's foot.

[0012] The front sole 3 is made of a soft and flexible elastomeric material with a hardness (UNI 4916) preferably lower than 80 ShoreA and optionally ranging between 69 and 75 ShoreA, and is preferably shaped/dimensioned so as to cover the tarsus-phalangeal portion 4a and the plantar-arch portion 4b of the bottom or insole 4, roughly up to the border with the talus-calcaneal portion 4c.

[0013] In other words, the front sole 3 only covers a portion of the bottom or insole 4 of shoe-upper 2.

[0014] Preferably, the front sole 3 is furthermore made of a soft and flexible elastomeric material with a density (UNI 7092) preferably ranging between 1.12 and 1.50 g/cm³ (grammes per cubic centimetre).

[0015] More in detail, in the example shown, the front sole 3 is preferably made of a soft and flexible elastomeric material such as, for example, the XS Edge compound or the GRIP 2 compound manufactured by VIBRAM.

[0016] The climbing shoe 1 furthermore comprises a rear sole 5 which is likewise made of a soft, flexible and substantially non-extendible, elastomeric material with a high friction coefficient, which is firmly fixed to the bottom or insole 4 of shoe-upper 2 preferably by gluing. Preferably, the rear sole 5 is moreover shaped/dimensioned so as to cover only the talus-calcaneal portion 4c of the

bottom 4, remaining spaced apart from the front sole 3.

[0017] The rear sole 5 is thus separate, discrete and spaced apart from the front sole 3.

[0018] More in detail, with reference to Figure 1, the front sole 3 and the rear sole 5 preferably delimit/form, on the bottom 4 of shoe-upper 2, an oblong and preferably substantially rectilinear, transversal cleft or slit 6 which extends on the bottom 4 of shoe-upper 2 transversally to the longitudinal centreline of the bottom 4.

[0019] Preferably, furthermore, the transversal cleft 6 has a maximum width lower than 15 mm (millimetres), and is preferably arranged at or close to the border between the talus-calcaneal portion 4c and the plantar-arch portion 4b of the bottom 4.

[0020] In addition, the width ℓ of the transversal cleft 6 preferably remains substantially constant along the entire length thereof.

[0021] In the example shown, in particular, the front sole 3 and the rear sole 5 are preferably arranged on the bottom 4 of shoe-upper 2 so as to form/delimit a transversal cleft 6 that preferably extends on the bottom 4 of shoe-upper 2 while remaining locally substantially perpendicular to the longitudinal centreline of the bottom 4, and moreover has a width ℓ preferably ranging between 6 and 8 mm (millimetres).

[0022] Preferably, the rear sole 5 is furthermore made of a soft and flexible elastomeric material with a hardness (UNI 4916) lower than that of the material forming the front sole 3.

[0023] More in detail, the rear sole 5 is preferably made of a soft and flexible elastomeric material with a hardness (UNI 4916) preferably lower than 60 ShoreA and optionally ranging between 45 and 55 ShoreA, and is preferably shaped/ dimensioned so as to cover at least 60% of the talus-calcaneal portion 4c of the bottom 4 of shoe-upper 2.

[0024] Preferably, the rear sole 5 is moreover made of a soft and flexible elastomeric material with a density (UNI 7092) preferably ranging between 1.15 and 1.50 g/cm³ (grammes per cubic centimetre).

[0025] With reference to Figures 1, 2, 6 and 7, the climbing shoe 1 additionally comprises one or more tensioning bands made of elastic material, i.e. a material with an elastic modulus (also known as Young's modulus) significantly lower than that of the soles 3 and 5, which are firmly fixed to the shoe-upper 2 preferably by gluing, and are adapted to embrace and tighten the shoe-upper 2 against the foot of the user.

[0026] Preferably, the tensioning bands are moreover pre-tensioned in order to embrace and strongly tighten the shoe-upper 2 against the foot of the user, and optionally also so as to firmly bend/curve downwards the foot of the user.

[0027] More in detail, the climbing shoe 1 is preferably provided with a front tensioning band 7 and a rear tensioning band 8, preferably both pre-tensioned, which are preferably made of highly elastic rubber or other elastomeric material with an elastic modulus preferably 2-3

times lower than that of the soles 3 and/or 5, and are firmly fixed to the shoe-upper 2 preferably by gluing.

[0028] The front tensioning band 7 surrounds the tip 9 of the shoe-upper 2. The rear tensioning band 8 instead surrounds the rear part of shoe-upper 2, remaining substantially above the heel portion 10 of shoe-upper 2, i.e. above the portion of shoe-upper 2 that covers the rear end of the calcaneus of the user's foot.

[0029] In the example shown, in particular, the tensioning straps 7 and 8 are preferably made of highly elastic rubber or other elastomeric material with a tensile strength (DIN 53504) preferably ranging between 17 and 23 N/mm² (Newtons per square millimetre), and with an elongation at break preferably ranging between 500% and 600%.

[0030] Preferably, the tensioning bands 7 and 8 are moreover made of an elastomeric material with a hardness (UNI 4916) preferably greater than 90 ShoreA.

[0031] More in detail, with reference to Figures 1 and 7, the front tensioning band 7 is substantially U-bent and is firmly fixed to the tip 9 of shoe-upper 2 so as to surround /embrace the tarsus-phalangeal portion of the foot of the user, i.e. the front part of the foot, preferably also prolonging/extending along the tarsus-phalangeal portion 4a of the bottom 4, underneath the front sole 3.

[0032] The rear tensioning band 8, in turn, is substantially U-bent and is firmly fixed to the rear part of shoe-upper 2, so as to cover the area of the shoe-upper 2 immediately above the heel portion 10, and then extend along the two inner and outer lateral sides 11 of shoe-upper 2 towards the tarsal-phalangeal portion 4a of the bottom 4, preferably up to reach and meet/join with the front tensioning band 7 preferably by gluing.

[0033] More in detail, the rear tensioning band 8 is preferably structured so as to reach and meet/join with the two ends 7a of front tensioning band 7 preferably on the two lateral sides 11 of shoe-upper 2, close to the bottom 4 of the shoe-upper 2 and near the border between the tarsus-phalangeal portion 4a and the plantar-arch portion 4b of the bottom 4, i.e. near the border between the tarsus-phalangeal region and the plantar arch region.

[0034] Preferably, the two ends 8a of rear tensioning band 8 furthermore extend on the bottom 4 of shoe-upper 2 one towards the other, so as to at least partially cover the plantar-arch portion 4b of the bottom 4 and optionally also part of the tarsus-phalangeal portion 4a and/or of the talus-calcaneal portion 4c of the bottom 4.

[0035] The two ends 8a of rear tensioning band 8 therefore extend along the bottom 4 of shoe-upper 2, underneath the front sole 3.

[0036] Preferably, though not necessarily, the two ends 8a of rear tensioning band 8 may also extend along the bottom 4 of shoe-upper 2 one towards the another, so as to meet and firmly join ton one another preferably within the plantar-arch portion 4b of the bottom 4.

[0037] More in detail, with reference to Figures 6 and 7, in the example shown the two ends 8a of rear tensioning band 8 are preferably shaped so as to cover at least

50% of the plantar-arch portion 4b of the bottom 4 of shoe-upper 2, in addition to a small part of the talus-calcaneal portion 4c.

[0038] With reference to Figures 1 to 7, additionally the climbing shoe 1 also comprises a rear protective insert 14 made of soft and flexible plastic material, which is shaped substantially like a concave shell, and is firmly fixed to the rear part of shoe-upper 2 preferably by gluing, so as to embrace and protect the calcaneus of the user's foot.

[0039] The rear sole 5, in turn, is substantially L-bent and is arranged immediately above the rear protective insert 14, substantially astride the midplane M of the shoe, so as to cover the talus-calcaneal portion 4c of the bottom 4 and then to rise up along the part of rear protective insert 14 covering the heel portion 10 of shoe-upper 2, towards the rear tensioning band 8, while remaining substantially astride the midplane M of the shoe. Preferably, the rear sole 5 moreover rises along the heel portion 10 of shoe-upper 2 up to reach the tensioning band 8.

[0040] The rear sole 5, therefore, at least partially overlaps the rear protective insert 14, and is firmly fixed to the rear protective insert 14 preferably by gluing.

[0041] More in detail, the rear sole 5 is provided with an horizontal segment 15 and a vertical segment 16 which are consecutive and substantially perpendicular to one another, and is arranged on the rear part of shoe upper 2 roughly astride the midplane M, so that the vertical segment 16 extends above/covers the part of the rear protective insert 14 that covers the heel portion 10 of shoe-upper 2, and preferably also so that the horizontal segment 15 extends above/covers the part of the rear protective insert 14 that covers the talus-calcaneal portion 4c of the bottom 4.

[0042] The rear protective insert 14 is moreover provided with a vertical groove 17 which extends astride the midplane M of the shoe, along the part of the rear protective insert 14 that covers the heel portion 10 of the shoe-upper 2, preferably up to the height of the rear tensioning band 8, and the vertical segment 16 of rear sole 5 extends inside the same vertical groove 17.

[0043] Preferably, the vertical groove 17 is furthermore dimensioned in such a way that the outer or "exposed" face 16e of the vertical segment 16 emerges/surfaces from the vertical groove 17 while remaining flush/at level with the outer surface of the rear protective insert 14, preferably substantially for the entire length of the vertical groove 17.

[0044] In the example shown, in particular, the rear protective insert 14 is preferably made via an injection moulding process, and is preferably made of a soft and flexible elastomeric material.

[0045] More in detail, the rear protective insert 14 is preferably made of a soft and flexible elastomeric material which has an elastic modulus lower than that of soles 3 and 5, and preferably greater than that of tensioning bands 7 and 8.

[0046] Preferably, the rear protective insert 14 is moreover made of an elastomeric material with a hardness greater than that of the material forming the soles 3 and/or 5. More in detail, in the example shown the rear protective insert 14 is preferably made of an elastomeric material with a hardness (UNI 4916) preferably ranging between 80 and 110 ShoreA.

[0047] More in detail, with reference to Figures 1, 4, 5, 6 and 7, in the example shown the rear protective insert 14 is preferably shaped/dimensioned so as to cover: the talus-calcaneal portion 4c of the bottom 4; the heel portion 10 of shoe-upper 2 preferably up to the height of the rear tensioning band 8, optionally also extending underneath the rear tensioning band 8; and lastly part of the two lateral sides 11 of shoe-upper 2.

[0048] Preferably, the rear protective insert 14 is furthermore shaped/dimensioned so as to also cover a part of the plantar-arch portion 4b of the bottom 4, preferably extending underneath the two ends 8a of the rear tensioning band 8.

[0049] With reference to Figures 2, 3 and 5, on the other hand, the vertical groove 17 extends along the rear protective insert 14 preferably up to the height of the rear tensioning band 8. Preferably, the vertical groove 17 moreover is preferably substantially complementary in shape to the vertical segment 16 of rear sole 5, so as to be able to accommodate/contain substantially the whole vertical segment 16 of rear sole 5.

[0050] More in detail, the vertical groove 17 has a transversal section that, substantially for the whole length of the groove, remains complementary to that of the vertical segment 16 of rear sole 5, so that the outer or "exposed" face 16e of the vertical segment 16 is always flush/at level with the outer surface of rear protective insert 14, preferably substantially for the entire length of the vertical groove 17.

[0051] In other words, the vertical groove 17 is dimensioned in such a way that the rear sole 5 cannot protrude outside of the vertical groove 17 substantially for the whole length of said groove.

[0052] With reference to Figures 1, 4, 6 and 7, the climbing shoe 1 is preferably furthermore provided with an upper protective sheet 18 made of soft and flexible elastomeric material, which is firmly fixed to the upper part of the shoe-upper 2 preferably by gluing, so as to cover the toes and the front portion of the instep of the user's foot, preferably also joining up with the front tensioning band 7.

[0053] More in detail, the upper protective sheet 18 is preferably made of a soft, flexible and substantially non-extendible, elastomeric material having a high friction coefficient.

[0054] In the example shown, in particular, the upper protective sheet 18 is preferably made of a soft and flexible elastomeric material with a hardness (UNI 4916) preferably lower than 90 ShoreA and optionally ranging between 45 and 75 ShoreA.

[0055] The functioning of climbing shoe 1 is easily in-

ferable from the above description, and therefore does not require further explanation.

[0056] The advantages resulting from the particular structure of the rear part of the climbing shoe are remarkable.

[0057] Firstly, having recessed the vertical segment 16 of rear sole 5 inside the vertical groove 17 of the rear protective insert 14 minimizes the risk of fraying of the end portion of rear sole 5.

[0058] Moreover, being laterally protected by the rear protective insert 14, the rear sole 5 can advantageously be made of a softer and more flexible material than the front sole 3, thus improving the grip of the climbing shoe 1 in the heel area.

[0059] Lastly, the transversal cleft 6 allows the rear part of the shoe to be bent downwards more easily, making extremely easy the insertion of the foot inside the climbing shoe 1.

[0060] It is finally clear that modifications and variations can be made to the climbing shoe 1 disclosed above without thereby departing from the scope of the present invention.

[0061] For example, in an alternative embodiment the rear sole 5, likewise the front sole 3, could be made of an elastomeric material with a hardness (UNI 4916) lower than 80 ShoreA and optionally ranging between 69 and 75 ShoreA.

[0062] Lastly, according to a further less-sophisticated and non-shown alternative embodiment, the rear sole 5 could be made in a single piece with the front sole 3 so as to form a large monolithic sole made of soft, flexible and substantially non-extendible, elastomeric material with a high friction coefficient, which is firmly fixed to the bottom or insole 4 of shoe-upper 2 preferably by gluing, so as to cover the whole bottom 4, and is additionally provided at the back with an oblong vertical tongue which rises up along the heel portion 10 of shoe-upper 2 while remaining substantially astride of the midplane M, and is completely embedded/housed inside the vertical groove 17 of the rear protective insert 14.

Claims

1. A climbing shoe (1) comprising: a substantially sock-like shoe-upper (2) which is shaped so as to accommodate and completely cover the foot of the user; a plastic-material, rear protective insert (14) which has a concave shape and is firmly fixed on the rear part of the shoe-upper (2) so as to cover the calcaneus of the foot of the user; a rear sole (5) which is firmly fixed to the bottom (4) and to the rear part of the shoe-upper (2), above the rear protective insert (14); and a plurality of elastic-material tensioning bands (7, 8) which are firmly fixed to the shoe-upper (2) so as to tighten the shoe-upper (2) onto the foot of the user; the rear sole (5) being substantially L-bent so as to
2. Climbing shoe according to Claim 1, **characterized in that** the vertical groove (17) is dimensioned so that the outer face (16e) of the vertical segment (16) emerges/ surfaces from the vertical groove (17) while remaining flush/at level with the outer surface of the rear protective insert (14).
3. Climbing shoe according to Claim 2, **characterized in that** the vertical groove (17) of the rear protective insert (14) is shaped substantially complementary to the vertical segment (16) of the rear sole (5) so as to accommodate/ contain substantially the whole vertical segment (16) of the rear sole (5).
4. Climbing shoe according to any one of the preceding claims, **characterized in that** the rear protective insert (14) is shaped so as to cover the talus-calcaneal portion (4c) of the bottom (4) of the shoe-upper (2), the heel portion (10) of the shoe-upper (2) and part of the two lateral sides (11) of the shoe-upper (2); the horizontal segment (15) of the rear sole (5) extending above the part of the rear protective insert (14) covering the talus-calcaneal portion (4c) of the bottom (4) of the shoe-upper (2) .
5. Climbing shoe according to any one of the preceding claims, **characterized in that** the rear protective insert (14) is made of an elastomeric material with hardness greater than that of the material forming the rear sole (5) .
6. Climbing shoe according to any one of the preceding claims, **characterized in that** the rear sole (5) is made of an elastomeric material with a hardness lower than 60 ShoreA.
7. Climbing shoe according to any one of the preceding claims, **characterized by** additionally comprising a front sole (3) which is firmly fixed to the bottom (4) of the shoe-upper (2), and is shaped so as to cover the tarsus-phalangeal portion (4a) and the plantar-arch portion (4b) of the bottom (4) of the shoe-upper (2) while remaining spaced from the rear sole (5).
8. Climbing shoe according to Claim 7, **characterized**

in that the front sole (3) and the rear sole (5) delimit/form, on the bottom (4) of the shoe-upper (2), a transversal cleft or slit (6) which extends on the bottom (4) of the shoe-upper (2) transversally to the longitudinal centreline of said bottom (4), and has a maximum width lower than 15 mm. 5

9. Climbing shoe according to Claim 8, **characterized in that** the transversal cleft or slit (6) is located near to the border between the talus-calcaneal portion (4c) and the plantar-arch portion (4b) of the bottom (4). 10
10. Climbing shoe according to Claim 7, 8 or 9, **characterized in that** the rear sole (5) is made of a soft and flexible elastomeric material having a hardness lower than that of the material forming the front sole (3). 15
11. Climbing shoe according to any one of the preceding claims, **characterized in that** said plurality of tensioning bands (7, 8) includes a front tensioning band (7) which is substantially U-bent and is firmly fixed to the tip (9) of the shoe-upper (2) so as to surround/embrace the tarsus-phalangeal portion of the foot of the user. 20 25
12. Climbing shoe according to any one of the preceding claims, **characterized in that** said plurality of tensioning bands (7, 8) includes a rear tensioning band (8) which is substantially U-bent and is firmly fixed to the rear part of the shoe-upper (2), so as to cover the area of the shoe-upper (2) immediately above the heel portion (10) and then extend along the two lateral sides (11) of the shoe-upper (2) towards the tarsus-phalangeal portion (4a) of the bottom (4) of the shoe-upper (2). 30 35
13. Climbing shoe according to Claim 12, **characterized in that** the rear tensioning band (8) extends along the two lateral sides (11) of the shoe-upper (2) up to meet and join with the front tensioning band (7). 40
14. Climbing shoe according to Claim 12 or 13, **characterized in that** the two ends (8a) of the rear tensioning band (8) extend on the bottom (4) of the shoe-upper (2) one towards the other, so as to at least partially cover the plantar-arch portion (4b) of said bottom (4). 45
15. Climbing shoe according to any one of the preceding claims, **characterized by** additionally comprising an upper protective sheet (18) which is made of a soft and flexible elastomeric material and is firmly fixed to the upper part of the shoe-upper (2), so as to cover the toes and the front portion of the instep of the foot of the user. 50 55

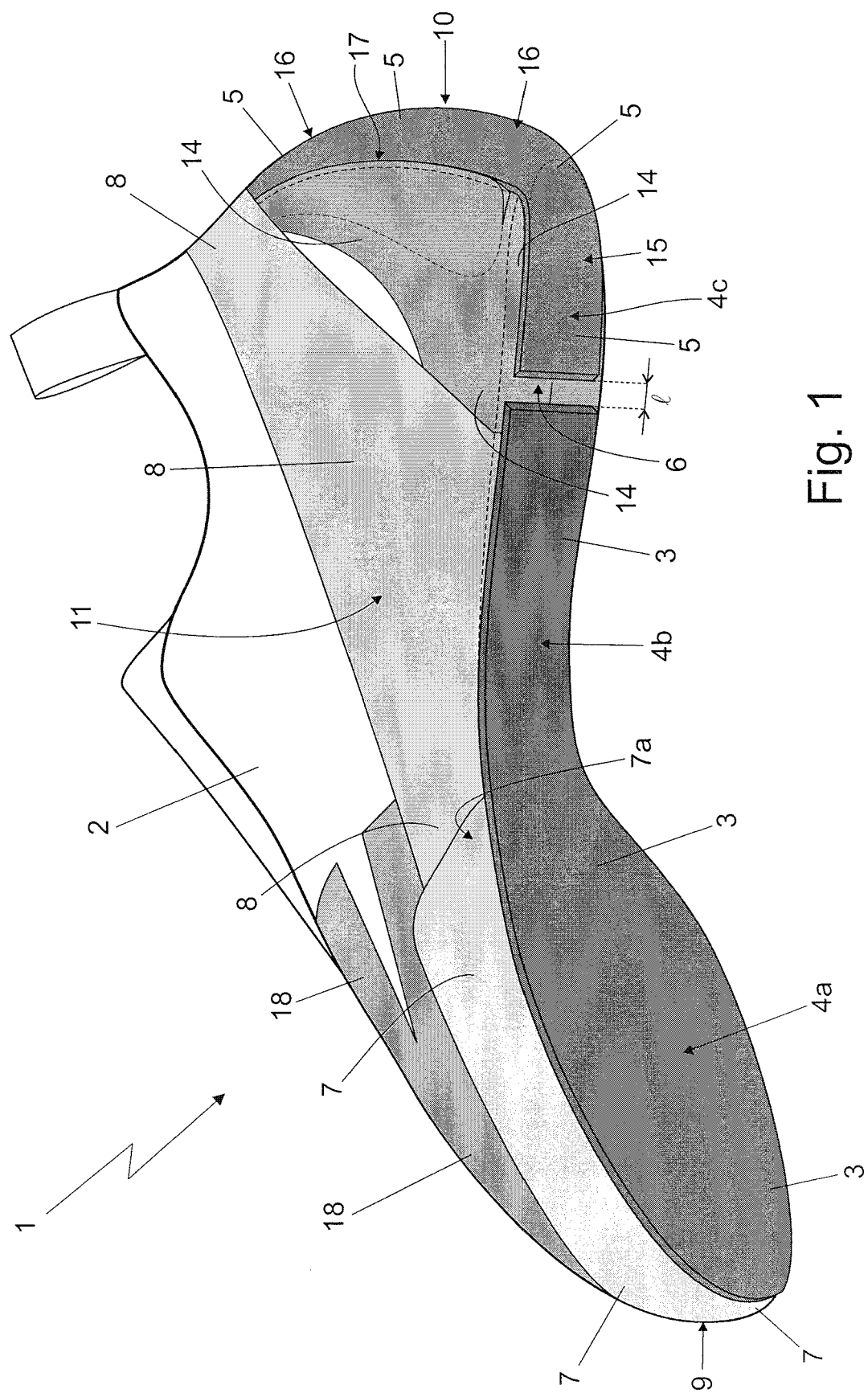


Fig. 1

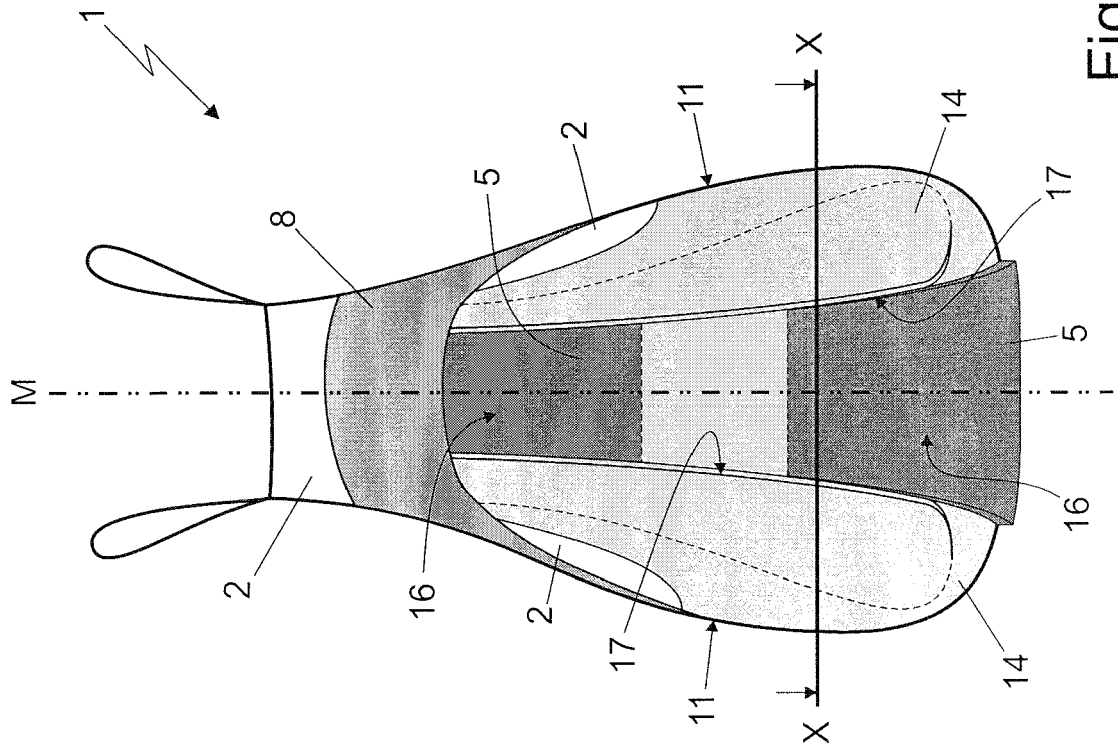


Fig. 2

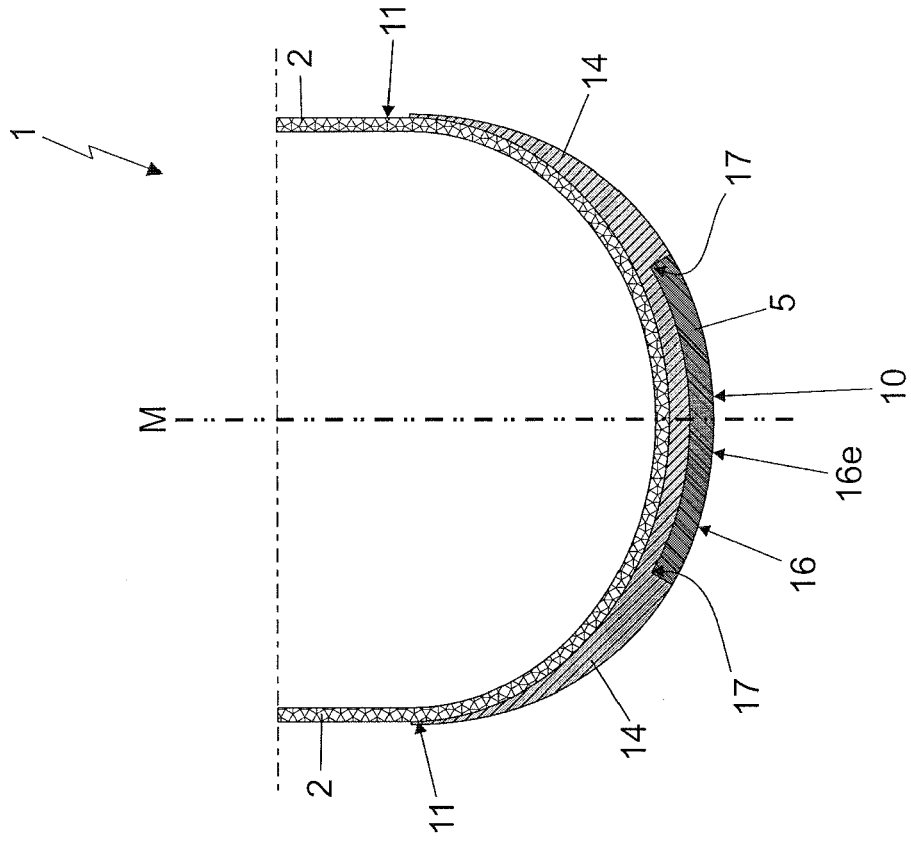
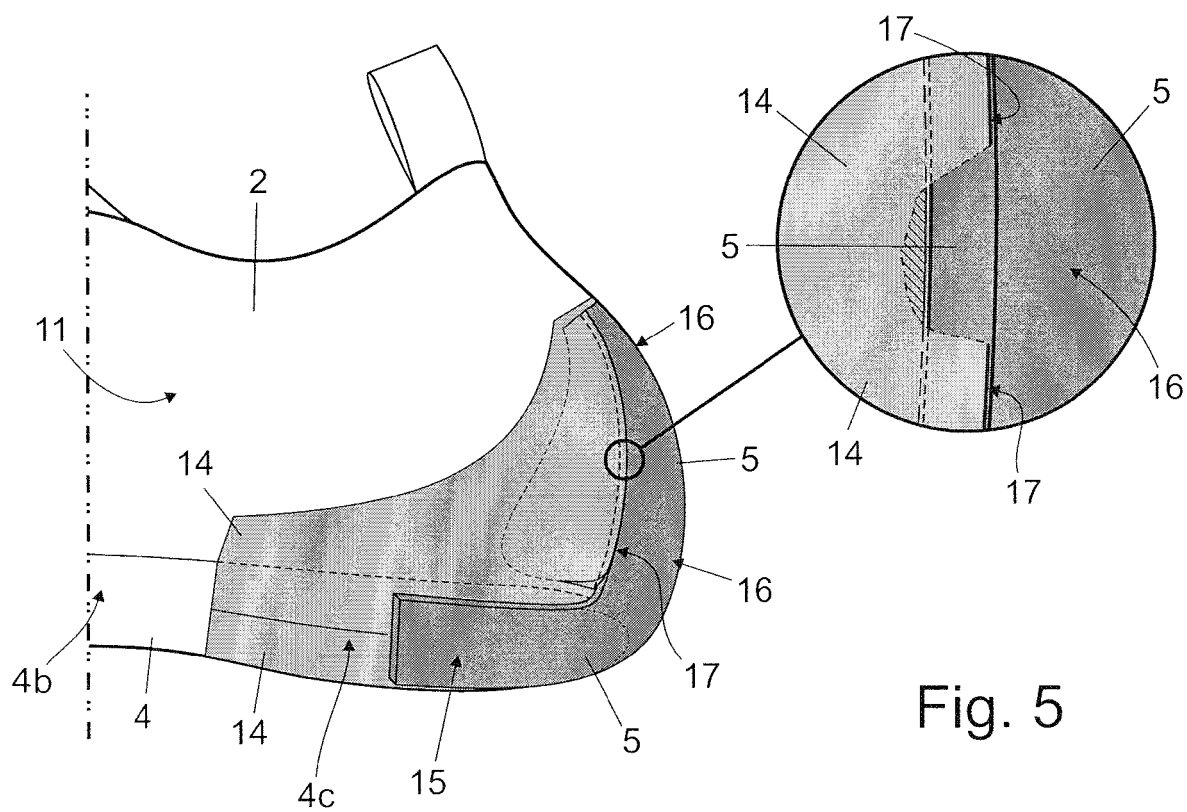
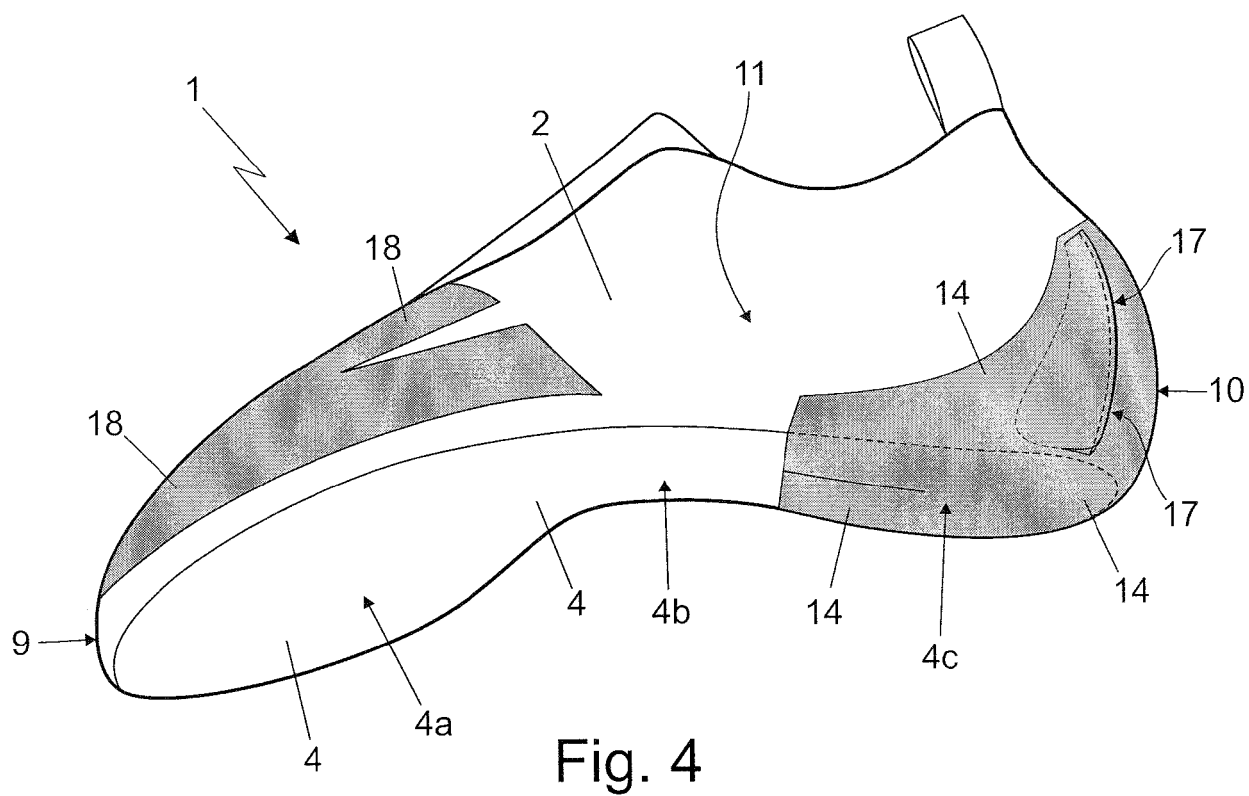


Fig. 3



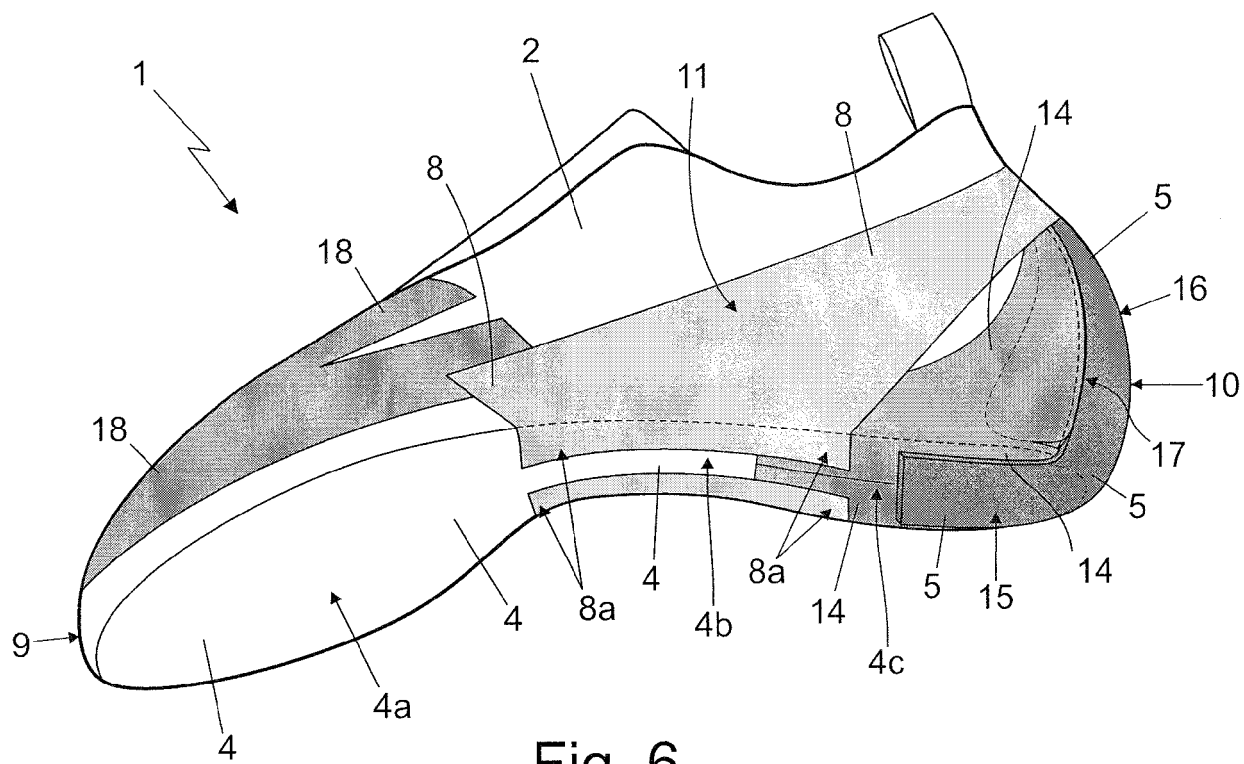


Fig. 6

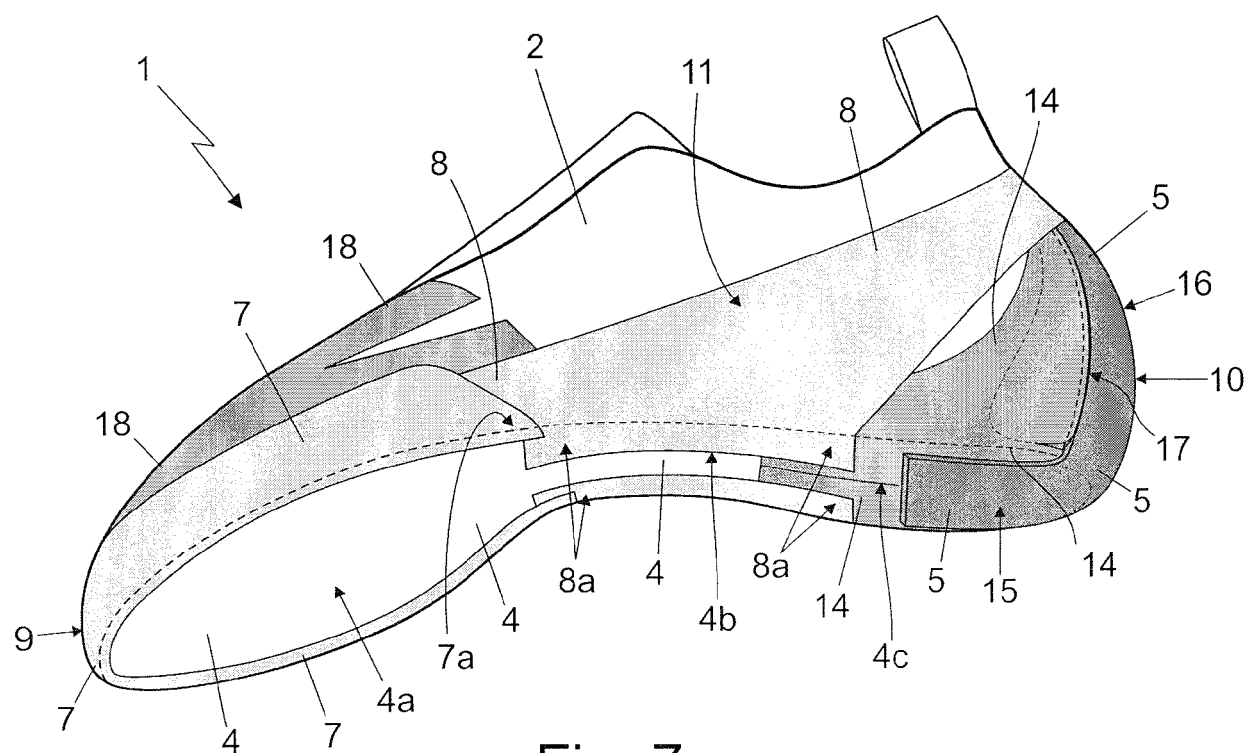


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
EP 18 17 8143

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 428 444 A1 (SALOMON SA [FR]) 16 June 2004 (2004-06-16)	1-7,11	INV. A43B5/00 A43B23/17
Y	* paragraphs [0016] - [0028]; figure 1 *	8-10, 12-15	
Y	----- EP 2 949 232 A1 (SCARPA CALZATURIFICIO SPA [IT]) 2 December 2015 (2015-12-02) * paragraphs [0021] - [0037]; figure 6 *	8-10, 12-15	
A	----- EP 2 274 994 A1 (SCARPA CALZATURIFICIO SPA [IT]) 19 January 2011 (2011-01-19) * paragraphs [0010] - [0034]; figures 1,3 *	1-15	
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		5 October 2018	Cianci, Sabino
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 17 8143

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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